

LOGGEPOLE PINE SERIES

Pinus contorta

PICO

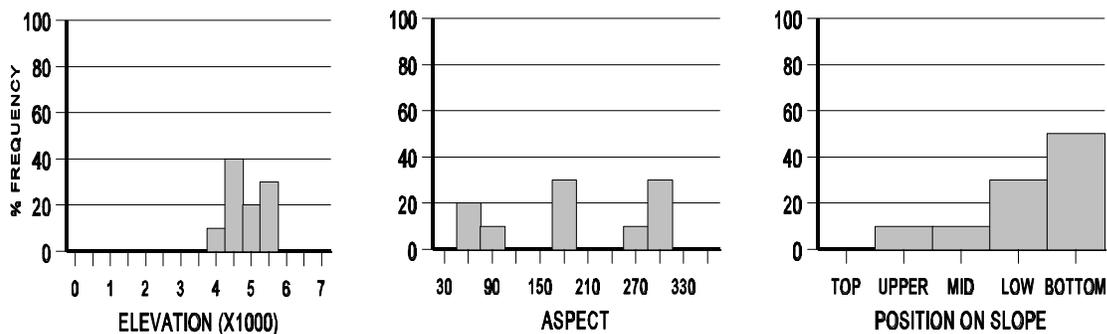
Lisa A. McCrimmon

Lodgepole pine grows throughout the western United States in a wide variety of environments. In the southern Oregon Cascades it occurs as a pioneer on young soils developed from deep pumice in cold environments. Lodgepole pine is usually succeeded by more tolerant species, such as white fir, as the increasing canopy ameliorates the frosty conditions. In areas with deep pumice soils, cold air ponding and frequent frosts, lodgepole pine remains the dominant climax tree species due to its tolerance of cold temperatures, resistance to drought, and minimal need for mineralized elements.

The Lodgepole Pine Series is found on the Mt. Mazama pumice and ash deposits in the broad, flat valley bottoms surrounding Diamond Lake and the Rogue River and its major tributaries east of Prospect. Around Diamond Lake the Series is more continuous, but along the Rogue River it is fragmented, found only in the areas of greatest cold air accumulation and deepest pumice. The Series also occurs on higher elevation flats adjacent to Crater Lake National Park and in isolated frost pockets. Without the cold air accumulation of the valley bottoms and flats, the Lodgepole Pine Series is replaced at lower elevations by the White Fir or Western Hemlock Series, and at upper elevations, by the Shasta Red Fir or Mountain Hemlock Series.

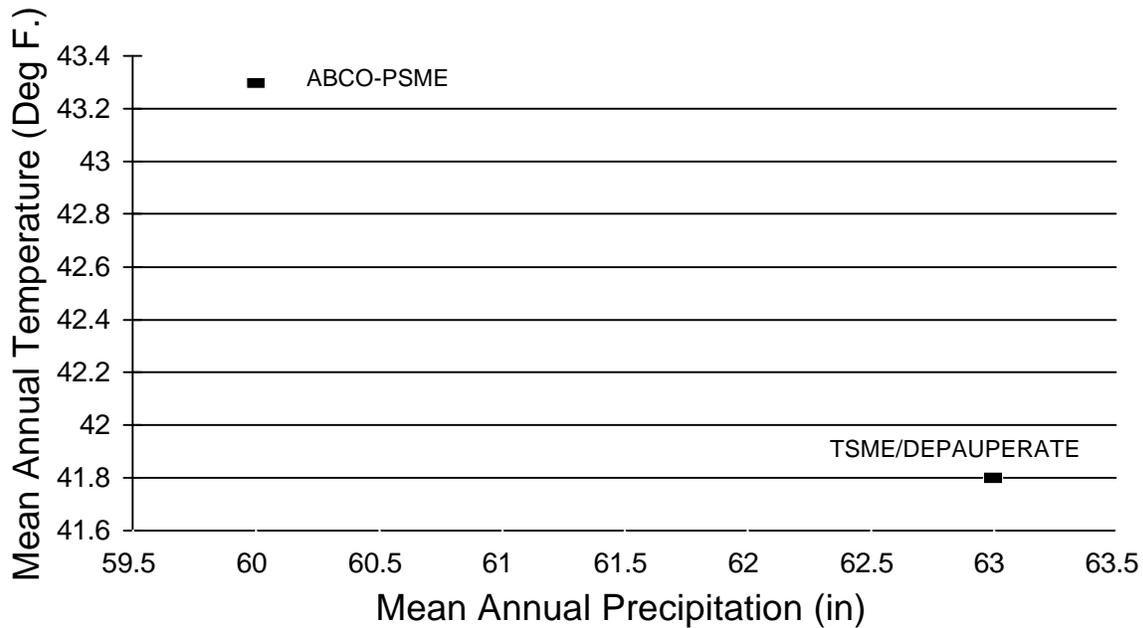
In the Siskiyou there are only a few small scattered sites where lodgepole pine continues to succeed itself. Areas with shallow soils, or standing water through most of the growing season, keep other species from regenerating. Due to the uniqueness and small acreage of each site, plant associations were not developed for lodgepole pine in the Siskiyou.

Elevation ranges from approximately 4400 feet to 5800 feet in the Cascades. Most aspects are represented and slopes are flat, ranging from 1 to 7 percent, though occasionally may be as steep as 15 percent. Due to the flat or gentle slopes, aspect does little to change the environmental conditions of the sites, so it is of lesser importance in this Series in differentiating between plant associations. Topographic position is mostly bottoms (valley bottoms and flats), but this Series can also be found higher on the slope when the slopes are gentle.



PICO 2

The Lodgepole Pine Series generally occurs in areas that are relatively cold and wet for the Cascades. Average annual temperature ranges from 41 degrees F to 44 degrees F with an average of 43 degrees F. Average annual precipitation ranges from 40 inches to 70 inches with an average of 61 inches. The relative environments of the plant associations are shown below. Each association is plotted by average annual temperature and average annual precipitation. Climate data for Lodgepole Pine/Thin-leaved Huckleberry-Grouse Huckleberry is unavailable.



Parent material is pumice and ash. Samples include two soil pits. Soils range from shallow to deep. Average surface rock cover is 2 percent with 15 percent gravel. Surface texture is sandy loam with 10 to 15 percent cobbles. Subsurface texture is also sandy loam with 15 to 90 percent cobbles. Pumice soils are generally young, shallow, infertile, and droughty. With time, organic matter accumulates, decomposes, and physical structure changes resulting in increases in soil fertility and water holding capacity, and changes in thermal properties.

Surface gravel cover ranges from 1 to 85 percent, with an average of 15 percent. Surface rock cover ranges from 0 to 5 percent, with an average of 2 percent. Exposed bedrock cover is 0 percent. Bare ground ranges from 1 to 2 percent, with an average of 1 percent. Litter cover ranges from 93 to 99 percent, with an average of 96 percent. Moss cover, however, is low, ranging from 0 to 20 percent, with an average of 4 percent. This reflects the cold, dry soil conditions typical of the Series.

Lodgepole pine is the dominant species in the overstory of the Lodgepole Pine Series. Lodgepole pine is also abundant in the understory. On warmer sites, white fir and/or western hemlock are present and on cooler sites, mountain hemlock and/or Shasta red fir are present. Grouse huckleberry and pinemat manzanita occur frequently throughout the Series with western serviceberry common.

Total species richness (the number of species of vascular plants) is calculated for each Association. The average total species richness for the Lodgepole Pine Series ranges between six and 24. Very low richness is six to nine species; low, 10 to 13

species; intermediate, 14 to 17 species; high, 18 to 21 species; and very high, 22 to 24 species.

Estimates of total cover by vegetation layer were made for wildlife interpretations. Upper layer tree cover ranges from 26 percent in Lodgepole Pine-White Fir-Douglas-fir to 45 percent in Lodgepole Pine-Mountain Hemlock/Depauperate and averages 34 percent for the Series. Mid-layer tree cover ranges from 19 to 33 percent and averages 27 percent. Lower layer tree cover averages 30 percent. High shrub cover ranges from 0 to 3 percent and averages 1 percent. Low shrub cover ranges from 0 to 26 percent and averages 15 percent. Herb/grass layer cover ranges from 1 to 20 percent and averages 12 percent.

Three final plant associations have been identified for the Series in southwestern Oregon. They were described from 10 plots: seven Forest Service plots and three Sky Lakes Wilderness plots. The following shows the relationship of draft and final plant associations. The draft associations are listed, with final associations below, each in order of most to least common, with the percentage of plots that make up each association (refer to Methods section).

PICO-TSME/CAPE5 (N=4)
 PICO-TSME/DEP (75%)
 PICO-ABCO-PSME (25%)

PICO/ARNE/LUPIN (N=3)
 PICO-ABCO-PSME (100%)

KEY TO THE LODGEPOLE PINE PLANT ASSOCIATIONS

- | | | |
|-----|--|-------------------------------|
| 1a. | White fir (ABCO) and/or Douglas-fir (PSME) present. | PICO-ABCO-PSME
Page PICO 4 |
| 1b. | White fir (ABCO) and Douglas-fir (PSME) absent. | 2 |
| 2a. | Shrub/herb/grass layer with greater than 10 percent cover. | PICO/VAME-VASC
Page PICO 6 |
| 2b. | Shrub/herb/grass layer with less than 3 percent total cover. | PICO-TSME/DEP
Page PICO 8 |

PICO 4

LOGEPOLE PINE-WHITE FIR-DOUGLAS-FIR

Pinus contorta-*Abies concolor*-*Pseudotsuga menziesii*

PICO-ABCO-PSME (N=4; FS=4)

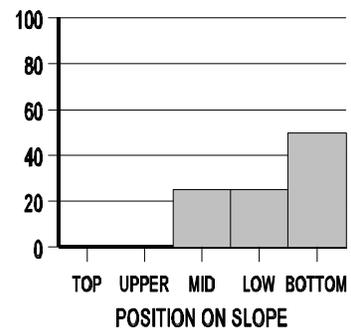
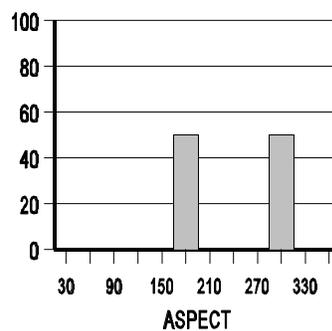
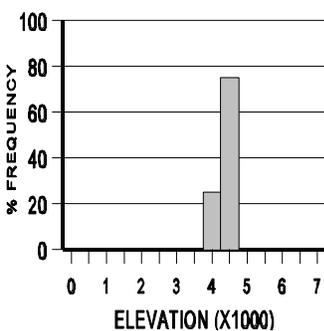


Distribution. Lodgepole Pine-White Fir-Douglas-fir occurs on the Diamond Lake Ranger District, Umpqua National Forest, and the Prospect, Ashland, and, likely, the Butte Falls Ranger Districts, Rogue River National Forest.

Distinguishing Characteristics. Lodgepole Pine-White Fir-Douglas-fir is the warmest association of the Series. The presence of white fir and Douglas-fir in the understory and the relatively rich shrub and herb layers indicate these warmer conditions.

Soils. Parent material is pumice or andesite. Soils are shallow to deep, with an average depth of greater than 38 inches. Average surface rock cover and gravel cover is 2 percent each. Based on one plot sampled, surface texture is sandy loam with 10 percent cobbles. Subsurface texture is sandy loam with 80 to 90 percent cobbles.

Environment. Elevation averages 4610 feet. Lodgepole Pine-White Fir-Douglas-fir



likely occurs on all aspects. Slope averages 4 percent and ranges from 1 to 5 percent. Slope positions range from middle one-third to valley bottom.

Vegetation Composition and Structure. Total species richness is very high for the Series, averaging 24 species. Overstory tree layer is dominated by lodgepole pine, with occasional Shasta red fir, Douglas-fir, and western white pine. Lodgepole pine dominates the understory, with white fir, Douglas-fir, and western white pine occurring frequently with low covers. Shasta red fir and mountain hemlock occur commonly with low covers. Pinemat manzanita, squaw carpet, and western serviceberry occur frequently in the shrub layer, with grouse huckleberry, squaw currant, green rabbit-brush, and Oregon boxwood occurring commonly. In the herb/grass layer, common prince's-pine, bottlebrush squirreltail, white-flowered hawkweed, and fireweed occur frequently, and woods strawberry, whitevein pyrola, woodland pinedrops, and bigleaf sandwort are common. Moss cover averages 6 percent.

Upper layer tree cover, low for the Series, averages 26 percent. Mid-layer tree cover is high, averaging 33 percent, and lower layer tree cover is intermediate, averaging 30 percent. High and low shrub cover are both high, averaging 3 and 26 percent, respectively. Herb/grass cover is high, ranging from 1 to 40 percent, with an average of 20 percent.

Common name	Code	Constancy	Cover	Richness
<u>Overstory trees</u>				2
Lodgepole pine	PICO	100	29	
Shasta red fir	ABMAS	25	5	
Douglas-fir	PSME	25	5	
Western white pine	PIMO3	25	2	
<u>Understory trees</u>				5
Lodgepole pine	PICO	100	40	
White fir	ABCO	100	6	
Douglas-fir	PSME	100	6	
Western white pine	PIMO3	75	2	
Shasta red fir	ABMAS	50	8	
Mountain hemlock	TSME	50	4	
<u>Shrubs</u>				6
Pinemat manzanita	ARNE	75	16	
Squaw carpet	CEPR	75	4	
Western serviceberry	AMAL2	75	2	
Grouse huckleberry	VASC	50	8	
Squaw currant	RICE	50	3	
Green rabbit-brush	CHVI8	50	2	
Oregon boxwood	PAMY	50	2	
<u>Herbs</u>				11
Common prince's-pine	CHUM	75	5	
Bottlebrush squirreltail	SIHY	75	2	
White-flowered hawkweed	HIAL2	75	1	
Fireweed	EPAN2	75	1	
Woods strawberry	FRVEB3	50	5	
Sedge species	CAREX	50	2	
Whitevein pyrola	PYPI2	50	1	

PICO 6

LOGEPOLE PINE/THIN-LEAVED HUCKLEBERRY-GROUSE HUCKLEBERRY

Pinus contorta/Vaccinium membranaceum-Vaccinium scoparium

PICO/VAME-VASC (N=3; Sky Lakes=3)

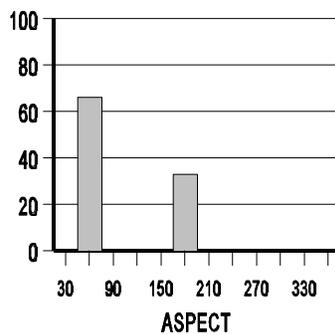
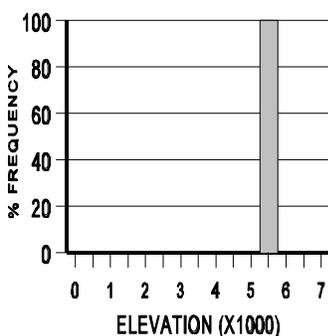


Distribution. Lodgepole Pine/Thin-leaved Huckleberry-Grouse Huckleberry occurs in the Sky Lakes Wilderness and may also occur on the Prospect and Butte Falls Ranger Districts, Rogue River National Forest.

Distinguishing Characteristics. Lodgepole Pine/Thin-leaved Huckleberry-Grouse Huckleberry is present at high elevations on cold flats with cold air drainage. Similar to Lodgepole Pine-Mountain Hemlock/Depauperate, Lodgepole Pine/Thin-leaved Huckleberry-Grouse Huckleberry has lower cover and constancy of mountain hemlock, and increased shrub and herb layers with high covers of thin-leaved huckleberry and grouse huckleberry, indicating it is a relatively warmer association.

Soils. Soil data are not available.

Environment. Elevation averages 5660 feet. Lodgepole Pine/Thin-leaved Huckleberry-Grouse Huckleberry occurs on northeast and south aspects, but likely



occurs on all aspects. Slope averages 8 percent and ranges from 1 to 15 percent. Lower one-third and valley bottom slope positions predominate.

Vegetation Composition and Structure. Total species richness is intermediate for the Series, averaging 15 species. Overstory tree layer is dominated by lodgepole pine. Understory is dominated by lodgepole pine, with mountain hemlock occurring commonly, and western white pine, Shasta red fir, and golden chinquapin occurring occasionally. In the shrub layer, thin-leaved huckleberry and grouse huckleberry occur frequently with moderate to high covers. Pinemat manzanita, subalpine spirea, and western serviceberry occur commonly. Pinemat manzanita may have moderate covers. In the herb/grass layer, sickle-keeled lupine, long-stalked clover, and spreading phlox occur commonly. Moss cover averages 2 percent.

Vegetation layer cover data are not available.

Common name	Code	Constancy	Cover	Richness
<u>Overstory trees</u>				1
Lodgepole pine	PICO	100	47	
<u>Understory trees</u>				3
Lodgepole pine	PICO	100	29	
Mountain hemlock	TSME	67	5	
Western white pine	PIMO3	33	1	
Shasta red fir	ABMAS	33	1	
Golden chinquapin	CACH6	33	1	
<u>Shrubs</u>				4
Thin-leaved huckleberry	VAME	100	33	
Grouse huckleberry	VASC	100	27	
Pinemat manzanita	ARNE	67	12	
Subalpine spirea	SPDE	67	2	
Western serviceberry	AMAL2	67	1	
Greenleaf manzanita	ARPA6	33	1	
<u>Herbs</u>				7
Sickle-keeled lupine	LUAL3	67	3	
Long-stalked clover	TRLO	67	2	
Spreading phlox	PHDI3	67	1	
Woods strawberry	FRVEB3	33	3	
Queen's cup	CLUN2	33	3	
Common dogbane	APCA	33	3	
Long stolon sedge	CAPE6	33	3	
American vetch	VISP2	33	1	
Arrowleaf groundsel	SETR	33	1	
Nuttall's violet	VINU2	33	1	
Leafy lousewort	PERA	33	1	
White coiled-beak lousewort	PECO	33	1	
Fireweed	EPAN2	33	1	
One-sided pyrola	PYSE	33	1	
Threeleaf anemone	ANDE3	33	1	

PICO 8

LOGEPOLE PINE-MOUNTAIN HEMLOCK/DEPAUPERATE

Pinus contorta-Tsuga mertensiana/Depauperate

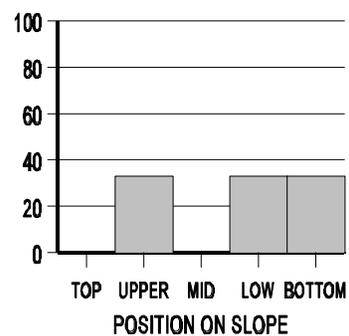
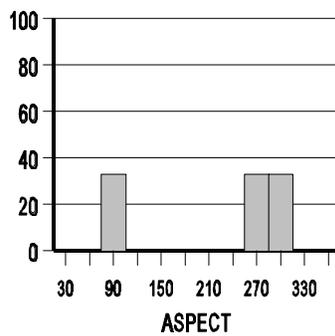
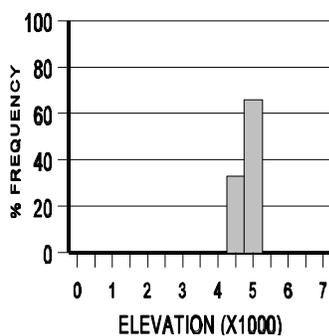
PICO-TSME/DEP (N=3; FS=3)



Distribution. Lodgepole Pine-Mountain Hemlock/Depauperate occurs on the Diamond Lake Ranger District, Umpqua National Forest, and may also occur on the Prospect or Butte Falls Ranger Districts, Rogue River National Forest.

Distinguishing Characteristics. Lodgepole Pine-Mountain Hemlock/Depauperate occurs on pumice/ash flats above 4500 feet in elevation or in depressions, at lower elevations, that collect cold air. Lodgepole Pine-Mountain Hemlock/Depauperate is the coldest association of the Series. Lodgepole pine and mountain hemlock in the regeneration layer and the lack of, or minimal, shrub and/or herb/grass layers indicate the cold conditions of this Association.

Soils. Parent material is pumice. Soils are moderately deep to deep, with an average depth of greater than 32 inches. Average surface rock cover is 1 percent, with 32 percent gravel. Based on one plot sampled, surface texture is sandy loam with 15 percent cobbles. Subsurface texture is sandy loam with 15 to 25 percent



cobbles.

Environment. Elevation averages 5170 feet. Lodgepole Pine-Mountain Hemlock/Depauperate occurs on northeast and west aspects but it is likely to occur on any aspect. Slope averages 4 percent and ranges from 2 to 7 percent. Lower slope positions predominate.

Vegetation Composition and Structure. Total species richness is very low for the Series, averaging six species. Lodgepole pine dominates the overstory with occasional Shasta red fir and mountain hemlock, both with low covers. Lodgepole pine dominates the understory and mountain hemlock occurs frequently with low cover. Shasta red fir and western white pine occur occasionally. Shrub richness is very low for the Series with grouse huckleberry occurring occasionally. Herb/grass richness is also very low for the Series with long stolon sedge, velvet lupine, two-colored lupine, and slender hairgrass occurring occasionally with very low covers. Moss cover averages less than 1 percent.

Upper layer tree cover is high for the Series, averaging 45 percent. Mid-layer tree cover is low, averaging 19 percent. Lower layer tree cover is intermediate, averaging 30 percent. High shrub, low shrub, and herb covers are all low for the Series, averaging 0, less than 1, and 1 percent, respectively.

Common name	Code	Constancy	Cover	Richness
<u>Overstory trees</u>				2
Lodgepole pine	PICO	100	27	
Shasta red fir	ABMAS	33	5	
Mountain hemlock	TSME	33	2	
<u>Understory trees</u>				3
Lodgepole pine	PICO	100	45	
Mountain hemlock	TSME	100	4	
Shasta red fir	ABMAS	33	10	
Western white pine	PIMO3	33	2	
<u>Shrubs</u>				0
Grouse huckleberry	VASC	33	1	
<u>Herbs</u>				2
Long stolon sedge	CAPE6	33	1	
Velvet lupine	LULE3	33	1	
Two-colored lupine	LUBI	33	1	
Slender hairgrass	DEEL	33	1	
Sedge species	CAREX	33	1	